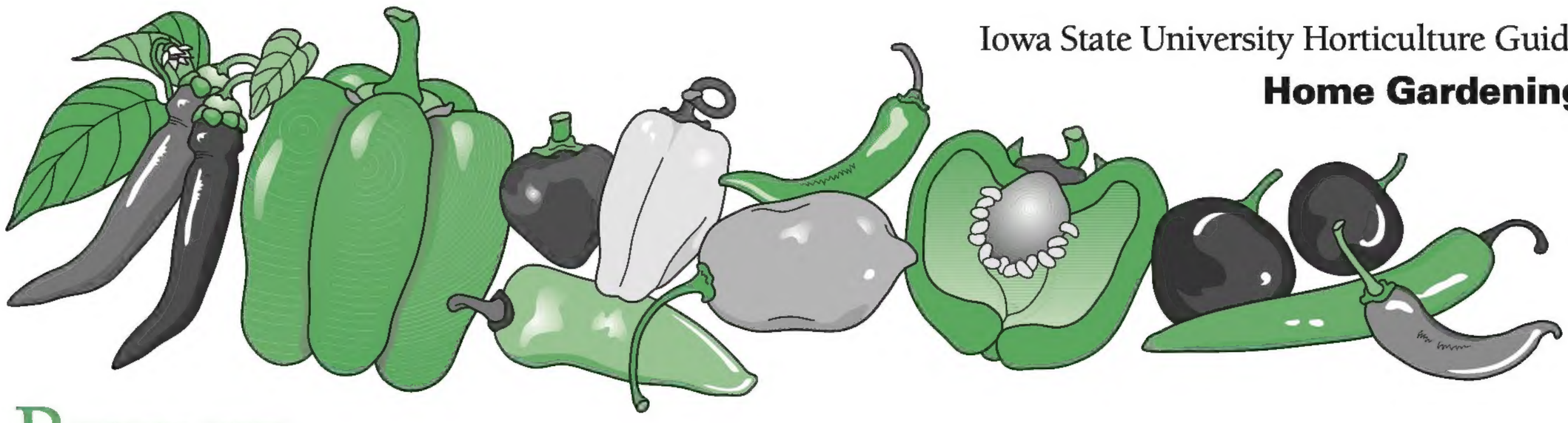

Peppers

By Eldon Everhart, Cindy Haynes, and Richard Jauron

Peppers were domesticated in Mexico. As early as 6,000 years ago, red peppers were used in tropical South America as a spice to disguise the taste of bland or unpalatable food. Chili peppers are called **chile** in Mexico and Central America and **aji** in South America and the West Indies. Columbus took peppers back to Europe where they rapidly became popular.

Pepper cultivars, which number in the hundreds, are usually classified as sweet or hot. Peppers also vary by fruit shape, flavor, pungency, color, and culinary use. Pickling, grinding, roasting, drying, and freezing can influence flavor.

All bell peppers belong to the species *Capsicum annuum*. Hot peppers may belong to several other species. The *C. chinense* varieties Habanero and Scotch Bonnet are considered the hottest.

Cultivars

Bell peppers are large, blocky, 3- or 4-lobed fruit that taper slightly at the bottom. Most bell peppers are sweet and dark green. Depending on the cultivar, the fruit will turn red, yellow, orange, or some other color at maturity.

Sweet peppers	Season	Color at maturity	Other
Bell Boy F1	70–72 days	green to red	Thick-walled fruit. TMV resistant
Bell Captain F2	72 days	green to red	Do well in stressed conditions. TMV tolerant
Big Bertha F1	72 days	green to red	Widely adapted proven performer. TMV tolerant
California Wonder	75 days	green to red	Good for stuffing
Jupiter	74 days	green to red	Consistently large size. TMV resistant
Keystone Resistant Giant	80 days	dark green to red	TMV resistant
Lady Bell F1	71 days	green to red	TMV resistant
North Star F1	63 days	green to red	Sets fruit under adverse conditions. TMV resistant
Yolo Wonder	75 days	green to red	Average size, thick-walled fruit

Pepper type	Size	Shape	Wall	Use
Bell or Sweet	large	blocky, few elongated	thick	fresh, cooked
Pimiento	large	heart-shaped	thick	processing
Ancho	large	long, blocky	thin	fresh
Anaheim	large	long, thin tapering	thin	fresh
Cayenne	medium	very thin, tapering	thin	fresh, dried, processed
Cubanelle	large	irregular, blunt	thin	processed, fresh
Jalapeno	small	oblong, blunt	thick	processed, fresh
Ornamental	small	slim	thin	processed, fresh
Cherry	small	round, flattened	thick	processed
Wax or Hungarian Wax	medium	oblong	thick	fresh

TMV = Tobacco Mosaic Virus

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How hot is hot?

The pungency or heat of a pepper depends on seven closely related alkaloids or capsaicinoids. In the early 1900s, Wilbur L. Scoville devised a test to determine the relative hotness of different peppers. Capsaicin from a known weight of pepper was extracted with alcohol and mixed in various concentrations with sweetened water. Human tasters were asked to identify the point at which water neutralized the hotness. The volume of water required for each sample was assigned a rating in Scoville units—the larger the number, the more water needed and the hotter the pepper. A high-pressure liquid chromatography test replaced this technique in the early 1980s, but the measurements are still expressed in Scoville units. The following peppers are listed from most hot to least hot, according to Scoville units.

Find it on the thermometer!

Habanero
- Caribbean Red _____ 100,000–445,000
- Red _____ 80,000–285,000
- Scotch Bonnet _____ 80,000–260,000

Jamaican Hot _____ 100,000–200,000

Chiltepini _____ 50,000–100,000
Santaka
Thai

Cayenne _____ 50,000–70,000
Charleston Hot

Piquin _____ 30,000–50,000
Aji
Cayenne
Tabasco

Thai Dragon _____ 35,000–45,000

De Arbol _____ 15,000–30,000

Serrano _____ 5,000–23,000

Yellow Wax _____ 5,000–15,000

Jalapeño _____ 2,500–5,000
Mirasol

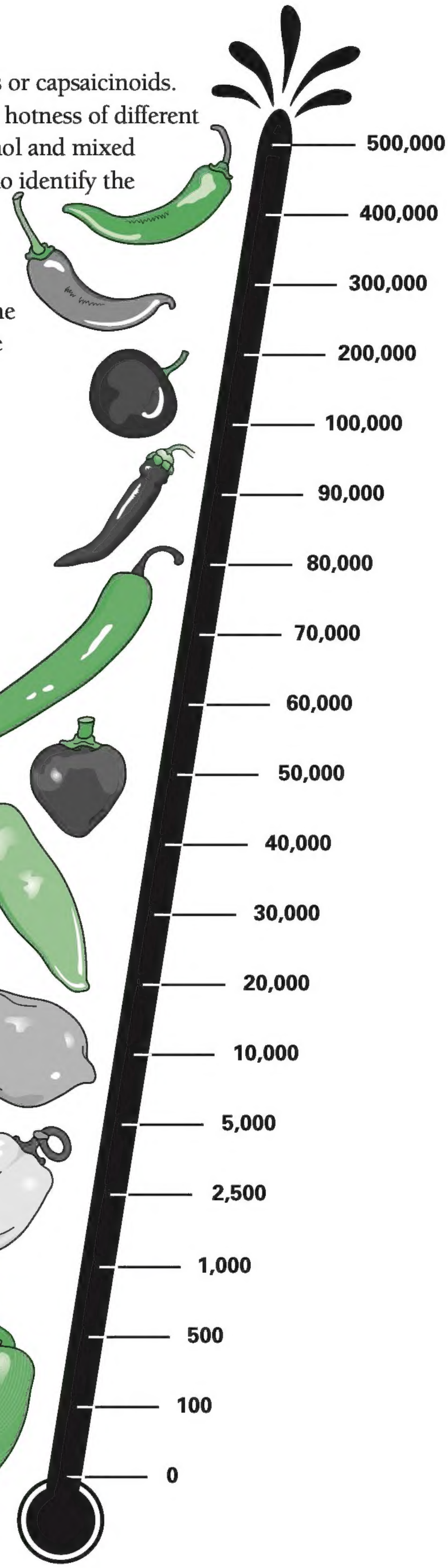
Cascabel _____ 1,500–2,500
Rocotillo
Sandia

Ancho _____ 1,000–1,500
Chilaca
Espanola
Pasilla
Poblano

Anaheim _____ 500-1,000
Big Jim
New Mexico

Cherry _____ 100–500
Mexi-Bell
Peperoncini

Bell _____ 0
False Alarm
Pimento
Sweet Banana
Sweet Italian



Adapted from *Peppers: Safe Methods to Store, Preserve, and Enjoy.* University of California publication 8004. 1998. The complete publication is available at http://anrcatalog.ucdavis.edu/.

Planting

Pepper plants grow best in warm, well-drained soils of moderate fertility. The plants are not particularly sensitive to soil pH, but best results are obtained in the 6.0 to 6.8 range.

Peppers are a warm-season crop and need a long season for maximum production. Temperature has a large effect on the rate of plant and fruit growth and the development and quality of the red or yellow pigments. Ideal temperature for red pigment development is 65–75° F. Above this range the red color becomes yellowish. Below it, color development slows dramatically and stops completely below 55° F.

Pepper plants can be purchased at garden centers or started indoors 6 to 8 weeks before the intended outdoor planting date. Transplant peppers into the garden after the danger of frost is past. In central Iowa, May 15 is the suggested planting date. Gardeners in southern Iowa can plant one week earlier, while those in northern areas should wait an extra week. The last practical date for planting peppers is approximately June 20.

Water plants thoroughly after transplanting.

Spacing

Space plants 18 inches apart in rows 24 to 30 inches apart.

Estimated yield

Average yield with good management practices should be approximately 80 pounds per 10-foot row.

Fertilizing

It is generally safe to apply 2 to 3 pounds of 5-10-5 per 100 square feet to the garden area where peppers will be planted. Conduct a soil test for specific P and K recommendations.

After transplanting, feed the pepper plants with a starter fertilizer solution. Dissolve 2 tablespoons of a 5-10-5 fertilizer in a gallon of water, then pour 1 cup of the solution at the base of each plant.

Potential problems

Blossom end rot

Water-soaked areas that develop near the blossom end of the fruit characterize blossom end rot. The affected tissue desiccates, becoming brown and leathery. Affected fruit may ripen prematurely. Secondary fungi and bacteria may colonize the dead tissue, causing it to turn dark and rot. Blossom end rot is caused by a calcium deficiency in developing fruit. It occurs in fields with low or moderate soil calcium levels. Fluctuating soil moisture due to over watering or drought, high nitrogen fertilization, and root pruning during cultivation also can cause blossom end rot.

Poor crop

Blossoms of sweet bell peppers are sensitive to temperature extremes. Flowers will drop off when night temperatures are below 60° F or above 85° F. Maximum set of sweet bell peppers occurs between constant temperatures of 60–70° F. Temperature tolerance for sweet bell peppers varies with cultivar. Hot peppers usually set well in warm weather. An adequate moisture supply during flowering and fruit set also is important. Mulching helps conserve soil moisture.

Sunscald

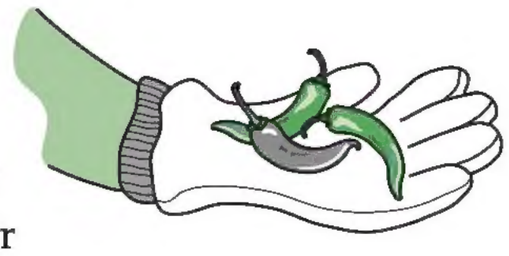
The heat of the sun may burn the side of the fruit exposed to the sun. Initially, a soft, light-colored area develops on the fruit. Later the area dries, becoming white and paper-like in appearance. The risk for sunscald can be reduced by controlling leaf diseases that may defoliate the plants, and by lightly fertilizing plants to promote growth.

Harvest and storage

Hot peppers and bell peppers can be harvested in the immature green stage or when fully ripe. They can be eaten fresh, used in sauces, pickled, frozen, or dried.

Bell peppers are usually harvested when large and firm in the immature green stage. They also may be allowed to fully ripen to red, yellow, orange, purple, or other colors. Fully ripe bell peppers are slightly sweeter and have a higher vitamin content than do the immature green peppers.

Fresh peppers may be stored for up to 3 weeks in cool, moist conditions (45 to 50° F and 85 to 90 percent relative humidity).



Wearing gloves and working in a well ventilated room is recommended when working with hot peppers because their volatile oils can cause burns or irritate sensitive skin. Avoid touching your eyes and other sensitive areas after handling hot peppers.

For more information

Contact your local Iowa State University Extension office for additional information or copies of the following publications.

Canning Vegetables, PM 1044
Container Vegetable Garden, PM 870B
Freezing Fruits and Vegetables, PM 1045
Garden Soil Management, PM 820
Organic Mulches for Gardens and Landscape Plantings, RG 209
Planting a Home Vegetable Garden, PM 819
Preserve Food Safely, N 3332
Questions about Composting, RG 206
Small Plot Vegetable Gardens, PM 870A
Starting Garden Transplants at Home, PM 874
Watering the Home Garden—Use of Trickle Irrigation, PM 823
Where to Put Your Vegetable Garden, PM 814

Additional information also is available from these Web sites.

ISU Extension publications

http://extension.iastate.edu/Pubs

ISU Horticulture

http://www.hort.iastate.edu/

Questions also may be directed to the ISU Extension Hortline by calling 515-294-3108 during business hours (8 a.m.–12 noon, 1 p.m.–5 p.m. Monday–Friday).

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